Untangling Jellyfish

The hard life of galaxies

Callum Bellhouse
1. Why Chile?
2. The VLT
3. Space Jellyfish!
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Things to consider when building an observatory:
Best place in Europe: La Palma
For Southern hemisphere, we have to look elsewhere!

*The birth of the European Southern Observatory*
High Altitude
Dark Skies
Cloudless Skies!

Image credit: NASA, Hubble, STS-61 Endeavour
Santiago de Chile
Santiago de Chile
Santiago de Chile
Valle de la Luna, Atacama
Altiplanico, Atacama
Valle de Elqui, Northern Chile
Los Andes
1. Why Chile?
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ESO and the VLT
(Very Large Telescope)
4 Unit Telescopes function individually, or as one large telescope
Each individual UT contains a set of advanced instruments
And all telescopes can work together as an “interferometer”
What makes the VLT so great?
Technology!
Technology!

Instruments mounted on each side of each UT

Active optics move to counteract gravity

Everything floats on a bath of oil
Technology!

Secondary mirror moves to counteract “seeing”

Lasers fire up into the sky to measure the motion of the atmosphere

Lasers!
1. Why Chile?
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Two families of galaxies

**Elliptical**
- No dust
- Random rotation
- No substructure

**Spiral**
- Lots of dust
- Uniform rotation
- Bulge, disk, arms, bars
The Hubble Tuning Fork?

**Elliptical**
- No dust
- Random rotation
- No substructure

**Spiral**
- Lots of dust
- Uniform rotation
- Bulge, disk, arms, bars
In modern models, Spirals *become* ellipticals

Dust is used/removed
Rotation is disturbed?
Structure is lost
How can we remove the gas?

In isolated Galaxies...

AGN Feedback

Supernova Feedback
How can the gas be removed?

In isolated Galaxies...
- AGN Feedback
- Supernova Feedback

In Galaxy Clusters...
- Mergers
- Harassment
How can the gas be removed?

In isolated Galaxies...
- AGN Feedback
- Supernova Feedback

In Galaxy Clusters...
- Mergers
- Strangulation
- Harassment
- Ram-Pressure Stripping

How can the gas be removed?
Ram-Pressure Stripping

Galaxy Clusters: Cosmic cities
Ram-Pressure Stripping

Galaxies
Ram-Pressure Stripping

Dark Matter
(Gravitational Lensing)
Ram-Pressure Stripping

Hot Gas
(X-Ray)
Ram-Pressure Stripping
Ram-Pressure Stripping
GASP Survey of Jellyfish Galaxies
Visualising Jellyfish Galaxies

www.sr.bham.ac.uk/~callumb/aquarium/Jo194